NOS Coastal Environmental Monitoring Committee

Monitoring Inventory

Survey and Background Materials

December 1999

NOS Monitoring Programs

Initial Program classification

NOS Office: _____

Program name: _____

Program Type:

- ☐ On-going monitoring activities
- ☐ Historical monitoring
- ☐ Research that supports improved monitoring methods
- ☐ Monitoring not sponsored by NOS
- ☐ Not monitoring

Survey of NOS Monitoring Programs

November 1999

This survey inventories major characteristics of NOS' environmental monitoring programs. The results will be used by the NOS' Coastal Environmental Monitoring Committee to better identify important monitoring gaps and to help support the design of a more integrated coastal monitoring program. The survey's "checkbox" design is intended to help standardize responses from NOS programs, although additional response choices may be added, to better capture program activities.

Program Name: _____

_____

_____

Principal Contact:

Last Name: _____ First Name: _____

Phone: _____ Ext. _____ Fax: _____

Email: _____

NOS Office: _____

Division: _____

Branch: _____

Mailing Address: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____

Monitoring Purpose:

- ☐ Ecosystem Stressors (State)
- ☐ Ecosystem Health (Response)
- ☐ Program Evaluation (Perform. Measures)
- ☐ Early Warning of Future Problems
- ☐ Other: _____
- ☐ Human Health and Safety
- ☐ Commerce / Sustainable Economy
- ☐ Predictive Model Development

Mandates / Authorizations:

- ☐ Legislative Other: _____
  - ☐ Clean Water Act
  - ☐ Clean Air Act
  - ☐ Coastal Zone Management Act
  - ☐ Marine Protection, Research, and Sanctuaries Act
  - ☐ Endangered Species Act
  - ☐ Safe Drinking Water Act
  - ☐ Toxic Substances Control Act
  - ☐ Resource Conservation and Recovery Act
  - ☐ Comprehensive Environmental Response, Compensation, and Liability Act
- ☐ Administrative (Executive Order, etc.) _____
- ☐ Other: _____

Monitoring Focus: (Information is gathered to characterize ...)

- ☐ Water Quality and / or Quantity
- ☐ Habitat Distribution / Abundance / Biodiversity
- ☐ Socioeconomic Impacts
- ☐ Fish Distribution / Abundance / Biodiversity
- ☐ Sediment Characteristics and Quality
- ☐ Hydrographic and Oceanographic Conditions
- ☐ Shoreline Characteristics and Change
- ☐ Other: _____

Target Parameter Groups: (see Parameter Description attachment for more complete classification of parameters)

- ☐ Birds
- ☐ Geology / Sediments
- ☐ Invertebrates
- ☐ Hydrology
- ☐ Reptiles and Amphibians
- ☐ Physical Oceanography
- ☐ Marine Mammals
- ☐ Water Quality
- ☐ Fishes
- ☐ Air Quality
- ☐ Habitat / Vegetation
- ☐ Human Activities (Socioeconomic)
- ☐ Meteorology
- ☐ Pollution Sources

Temporal Characteristics of Monitoring Efforts:

Period of Record:

Start Date (mmm / yyyy): _____ End Date (mmm / yyyy): _____

☐ Historic ☐ Ongoing ☐ Planned

Frequency of Sampling / Collection:

☐ Hourly ☐ Daily

☐ Monthly ☐ Seasonally

☐ Annually ☐ Decadal

☐ Other: _____

Users / Customers: (please be as specific as possible as to who principally uses information and for what)

☐ NOS Program Use: _____

_____

☐ Federal Government: _____

_____

☐ State Government: _____

_____

☐ Local Government: _____

_____

☐ Regional Entities: _____

_____

☐ Academic: _____

_____

☐ Marine Private Sector: _____

_____

☐ General Public: _____

_____

☐ Congress: _____

_____

☐ Other: _____

_____

Funding Amounts:

FY '97:	☐ < $10K	FY '98:	☐ < $10K	FY '99:	☐ < $10K
	☐ $10K - $100K		☐ $10K - $100K		☐ $10K - $100K
	☐ $100K - $1,000K		☐ $100K - $1,000K		☐ $100K - $1,000K
	☐ > $1,000K		☐ > $1,000K		☐ > $1,000K

Availability of Data:

- ☐ On-line (describe how to access; i.e., Telnet, FTP, URL): _____
- ☐ Off-line (describe how to access): _____
- ☐ Costs (are cost associated with requests - explain): _____
- ☐ Access Constraints (describe any constraints on accessing data): _____
- ☐ Use Constraints (describe any constraints on using the data): _____

Monitoring Tier:

- ☐ Tier I

  Broad scale ecological characterization. Identifies emerging issues and tracks status and trends of coastal ecosystems. Typically, synoptic spatial coverage with more limited temporal resolution and / or ecological parameters.

- ☐ Tier II

  Develops cause and effect relationships among environmental stressors and ecological response variables. Higher spatial and temporal resolution, usually focused in regions or on issues identified through Tier I. Provide data and information directly relevant to remedial action plans.

- ☐ Tier III

  Spatially and temporally intensive at relatively few locations. Generally involves process research related to ecosystem response to environmental stresses.

List of NOS Monitoring Programs by Program Office

Working Definition of Monitoring – Repetitive measurements intended to establish a baseline or determine a trend of environmental change.

NCCOS

Center for Coastal Monitoring and Assessment (CCMA)

NS&T

Benthic Surveillance (1984-93) – 120 sites
Mussel Watch (1986-present) – 250 sites
Contaminant Sediment Monitoring??

Bioeffects Surveys
EMAP Cooperative Program – South Atlantic coast
Coral Reef Mapping
FKNMS – no take zone monitoring
Florida Bay restoration monitoring
Laboratory Sample Intercomparison sutidies

Center for Coastal Fisheries and Habitat Research (CCFHR) at Beaufort
-- Field & lab techniques for habitat restoration models for Atlantic & Gulf fisheries

Center for Coastal Environmental Health and Biomolecular Research (CCEHBR) at Charleston
-- field methods to detect marine toxins, HABs, and shellfish pathology
-- field methods to assess WQ and ecosystem health

Great Lake Environmental Research Lab (GLERL)
-- field methods to detect linkages between coastal environments, biological resources, and atmospheric influences

Center for Sponsored Coastal Ocean Research (CSCOR) - Coastal Ocean Program

Coastal Intensive Site Network (CISnet) – NOAA, EPA, NASA
– 41 sites for intensive (Tier 3) study, includes some NERR sites

National Geodetic Survey

National Continuously Operating Reference Station Network/National Spatial Reference System
- aerial photograph (image acquisition) for digital shoreline and nautical chart production

BAYONET – subsidence measurements

Ocean-loading Deformations – changes in ocean floor(?) due to semi-diurnal tides

Coast Survey

Hydrographic data

Center of Operational Oceanographic Products and Services

Physical Oceanographic Real-Time Systems (PORTS)
-- Real-time tide predictions and ancillary physical and meteorological measurements at 8 sites

National Water Level Observation Network (NWLON)
-- Water level data and ancillary physical and meteorological measurements at 189 sites

ORR

Restoration Monitoring (e.g. Exxon Valdez monitoring) – 1989-2004

CSC

C-CAP
Sea Grass Mapping
Coast Watch (sea surface temperature)
LIDAR (Light Detection and Ranging) – shoreline change analysis
Remotely sensed water quality – misc. satellite and aircraft technologies,
e.g., algal bloom tracking
Protected Area GIS (PAGIS)
Benthic Habitat Monitoring, e.g., Coral Reef mapping

OCRM

Sanctuaries

NERRS (25 Reserves)
System-Wide Monitoring Program
Water quality (underway since 1996 using 2 data loggers per reserve), biological communities and habitat change (proposed), and watershed land use changes (proposed)

CICEET

SPO

Socio-economic monitoring

Research the Following:

Coastal GOOS

Integrated Science for Ecosystem Challenges (through CENR)

Parameters Description List

		GROUP	SUBGROUP	PARAMETER DESCRIPTION
53	new	Habitat / Vegetation	Wetlands	Wetlands (Biomass / Growth)
54	new	Habitat / Vegetation	Wetlands	Wetlands Disease / Health
55	new	Habitat / Vegetation	Land Use / Land Cover	Land Use / Land Cover Characterization
56	new	Habitat / Vegetation	Land Use / Land Cover	Land Use / Land Cover (Count by Species)
57		Human Activities	Boating / Diving	Boating / Diving (Vessel Count)
58		Human Activities	Commercial Fishing	Commercial Fishing (Gear & Method)
59		Human Activities	Commercial Fishing	Commercial Fishing (Vessel Count)
60		Human Activities	Commercial Fishing	Fish Bycatch
61		Human Activities	Recreational Fishing	Recreational Fishing (User Survey)
62		Human Activities	Recreational Fishing	Recreational Fishing (Vessel Count)
63	new	Human Activities	Population	Demographics
64	new	Human Activities	Population	Employment
65		Hydrology	Freshwater Inflows / Outflows	Freshwater Inflows / Outflows
66		Invertebrates	Corals	Coral (Count / Cover by Species)
67		Invertebrates	Corals	Coral Characterization
68		Invertebrates	Corals	Coral Disease / Health
69		Invertebrates	Crustaceans	Crustacean (Count by Species)
70		Invertebrates	Crustaceans	Crustacean Characterization
71		Invertebrates	Crustaceans	Crustacean Disease / Health
72		Invertebrates	Crustaceans	Decapod (Count by Species)
73		Invertebrates	Crustaceans	Lobster (Count by Species)
74		Invertebrates	Crustaceans	Lobster Characterization
75		Invertebrates	Crustaceans	Lobster Disease / Health
76		Invertebrates	Crustaceans	Shrimp (Count by Species)
77		Invertebrates	Crustaceans	Shrimp Disease / Health
78		Invertebrates	Invertebrates - Other	Invertebrate (Count / Density)
79		Invertebrates	Invertebrates - Other	Invertebrate Characterization
80		Invertebrates	Molluscs	Bivalve (Count by Species)
81		Invertebrates	Molluscs	Bivalve Characterization
82		Invertebrates	Molluscs	Bivalve Disease / Health
83		Invertebrates	Molluscs	Conch (Count by Species)
84		Invertebrates	Molluscs	Mollusc (Count by Species)
85		Invertebrates	Sponges	Sponge (Count by Species)
86		Invertebrates	Sponges	Sponge Characterization
87		Invertebrates	Zoanthidea	Zoanthidea (Count by Species)
88		Mammals	Dolphins	Dolphin (Count by Species)
89		Mammals	Manatees	Manatee (Count)
90		Mammals	Manatees	Manatee Characterization
91		Meteorology	Air Temperature / Barometric Pressur	Air Temperature
92		Meteorology	Air Temperature / Barometric Pressur	Barometric Pressure
93		Meteorology	Evaporation	Evaporation
94		Meteorology	Meteorology - Other	Weather (general)
95		Meteorology	Precipitation	Precipitation
96		Meteorology	Relative Humidity	Relative Humidity
97		Meteorology	Solar Radiation / Cloud Cover	Cloud Cover
98		Meteorology	Solar Radiation / Cloud Cover	Solar Radiation
99		Meteorology	Wind Speed / Direction / Velocity	Wind Speed / Direction
100		Physical Oceanography	Conductivity	Conductivity
101	redefined	Physical Oceanography	Currents	Currents Speed / Direction
102	redefined	Physical Oceanography	Waves	Wave Height / Period
103		Physical Oceanography	Currents / Waves / Tides	Water Pressure
104		Physical Oceanography	Light Penetration / Attenuation	Light Penetration / Attenuation

Parameters Description List

		GROUP	SUBGROUP	PARAMETER DESCRIPTION
105		Physical Oceanography	Oxidation Reduction	Oxidation Reduction
106		Physical Oceanography	pH	pH
107		Physical Oceanography	Physical Oceanography - Other	Oxygen Isotopes
108		Physical Oceanography	Salinity	Salinity
109	redefined	Physical Oceanography	Water Level	Water Level
110	redefined	Physical Oceanography	Water Depth	Water Depth
111		Physical Oceanography	Water Temperature	Water Temperature
112	new	Physical Oceanography	Geodetic Controls	Horizontal / Vertical Benchmarks
113		Reptiles	Alligators / Crocodiles	Alligator / Crocodile (Count by Species)
114		Reptiles	Alligators / Crocodiles	Alligator / Crocodile Health
115		Reptiles	Alligators / Crocodiles	Alligator / Crocodile Nest Characterization
116		Reptiles	Sea Turtles	Sea Turtle (Count by Species)
117		Reptiles	Sea Turtles	Sea Turtle Characterization
118		Reptiles	Sea Turtles	Sea Turtle Disease / Health
119		Reptiles	Sea Turtles	Sea Turtle Nest Characterization
120		Water Quality	Alkalinity	Alkalinity
121	reorganiz	Water Quality	Phytoplankton	Photosynthesis / Respiration
122	reorganiz	Water Quality	Phytoplankton	Phytoplankton (Count by Species)
123	reorganiz	Water Quality	Phytoplankton	Phytoplankton Characterization
124	reorganiz	Water Quality	Zooplankton	Zooplankton (Count / Volume)
125	reorganiz	Water Quality	Zooplankton	Zooplankton Characterization
126		Water Quality	Chlorophyll / Pigments	Chlorophyll / Pigments
127		Water Quality	Coliform Bacteria	Fecal coliform Bacteria
128		Water Quality	Dissolved Oxygen	Dissolved Oxygen
129		Water Quality	Inorganics - Other	Inorganics (Other)
130		Water Quality	Inorganics / Nutrients	Alkaline Phosphatase
131		Water Quality	Inorganics / Nutrients	Bacterial Nutrient Uptake
132		Water Quality	Inorganics / Nutrients	Inorganics (Nutrients)
133		Water Quality	Inorganics / Nutrients	MBAS Total
134		Water Quality	Inorganics / Nutrients	Nitrogen & Compounds
135		Water Quality	Inorganics / Nutrients	Phosphorus & Compounds
136		Water Quality	Inorganics / Nutrients	Potassium
137		Water Quality	Inorganics / Nutrients	Total DIssolved Inorganic Carbon
138		Water Quality	Metals	Aluminum
139		Water Quality	Metals	Antimony
140		Water Quality	Metals	Arsenic
141		Water Quality	Metals	Cadmium
142		Water Quality	Metals	Cesium
143		Water Quality	Metals	Chromium
144		Water Quality	Metals	Cobalt
145		Water Quality	Metals	Copper
146		Water Quality	Metals	Iron
147		Water Quality	Metals	Lead
148		Water Quality	Metals	Magnesium
149		Water Quality	Metals	Manganese
150		Water Quality	Metals	Mercury
151		Water Quality	Metals	Nickel
152		Water Quality	Metals	Selenium
153		Water Quality	Metals	Silver
154		Water Quality	Metals	Strontium
155		Water Quality	Metals	Tin
156		Water Quality	Metals	Vanadium

Parameters Description List

		GROUP	SUBGROUP	PARAMETER DESCRIPTION
157		Water Quality	Metals	Zinc
158		Water Quality	Oil and Grease	Oil and Grease
159		Water Quality	Oil and Grease	Oil Spill
160		Water Quality	Oil and Grease	Tar
161		Water Quality	Organics - Other	Ethylene
162		Water Quality	Organics - Other	Phthalates
163		Water Quality	PAHs	PAHs
164		Water Quality	PCBs	PCBs
165		Water Quality	Pesticides / Herbicides	Pesticides / Antifoulant
166		Water Quality	Pesticides / Herbicides	Pesticides / Fungicides
167		Water Quality	Pesticides / Herbicides	Pesticides / Herbicides
168		Water Quality	Pesticides / Herbicides	Pesticides / Insecticides
169		Water Quality	Streptococcal Bacteria	Fecal streptococcal Bacteria
170		Water Quality	Total Organics	Organics
171		Water Quality	Toxicity	Algal Toxicity
172		Water Quality	Toxicity	Bacteria Toxicity
173		Water Quality	Toxicity	Echinoderm Toxicity
174		Water Quality	Toxicity	Zooplankton Toxicity
175		Water Quality	Turbidity / Suspended Solids	Turbidity / Suspended Solids
176		Water Quality	Water Clarity / Visibility	Water Clarity / Visibility
177		Water Quality	Water Color	Water Color
178		Water Quality	Water Quality - Other	Methane
179		Water Quality	Water Quality - Other	Radon
180		Water Quality	Water Quality - Other	Water Quality - Other
181	new	Water Quality	Groundwater Quality	Inorganics / Nutrients
182	new	Water Quality	Groundwater Quality	Metals
183	new	Water Quality	Groundwater Quality	Organics
184	new	Water Quality	Groundwater Quality	Pesticides / Herbicides
185	new	Water Quality	Groundwater Quality	Streptococcal Bacteria